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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,706	04/09/2004	Dhananjay Ashok Gore	030488	1545
23696	7590	10/17/2006	EXAMINER	
QUALCOMM INCORPORATED			VO, DON NGUYEN	
5775 MOREHOUSE DR.				
SAN DIEGO, CA 92121			ART UNIT	PAPER NUMBER
			2611	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/821,706

Applicant(s)

GORE ET AL.

Examiner

DON N. VO

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 15-29, 32-36, 38 and 39 is/are rejected.
- 7) ☒ Claim(s) 9-14, 30, 31 and 37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/7/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-4, 7, 15-18, 23, 24, 27, and 34-36 are rejected under 35 U.S.C. 102(a) as being anticipated by Eilts et al (EP 1 320 232; art cited by applicant).

Regarding claims 1-4, 7, 15-18, 23, 24, 27, and 34-36, Eilts, as shown in figures 1-9, teaches an apparatus and method for estimating the channel frequency response in OFDM communication systems. Channel impulse estimates are computed for every symbol, which contains a set of  $N_{tt}$  pilots. The computed channel impulse estimates are then averaged to obtain an overall channel impulse response which is extended to  $N$  points (where  $N$  is the total number of subcarriers and  $N > N_{tt}$ ) by zero-padding. An  $N$ -point FFT is then used to compute the final channel estimate. See also abstract, paragraphs [0007] – [0012], [0032], and [0035] – [0040].

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 5, 6, 8, 19-22, 25, 26, 28, 29, 32, 33, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eilts et al (EP 1 320 232; art cited by applicant) in view of Li (6,654,429; art cited by applicant) or Hutter et al ("Channel estimation for Mobile OFDM System"; document cited by applicant).

Regarding claims 5, 6, 8, 19-22, 25, 26, 28, 29, 32, 33, 38, and 39, Eilts teaches all subject matter claimed except for teaching the particular distributing of the pilot patterns as claimed. However, such distribution of pilot patterns is well known in the art of OFDM communication system. For example, Li or Hutter, from the same field of endeavor, teaches the distribution of the pilot patterns as claimed. See figure 4A and column 6, line 16 to column 7, line 30 of Li and figure 5 of Hutter. Therefore, it would have been obvious to one of ordinary skill in the

art at the time the invention was made to modify the OFDM communications system of Eilts by employing the pilot patterns as taught by Li or Hutter so as to improve channel estimation.

***Allowable Subject Matter***

6. Claims 9-14, 30, 31, and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References Eilts et al (US 2003/0108127) and Kannan et al (US 2006/0109925) are cited because they are pertinent to the method and apparatus for channel estimation in OFDM communication system.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DON N. VO whose telephone number is (571) 272-3018. The examiner can normally be reached on MON - FRI (9:00-6:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JAY PATEL can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



DON N. VO  
Primary Examiner  
Art Unit 2611